UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/585,267	07/10/2007	Koji Tominaga	KKP0002US	9701

23413 7590 02/08/2011

CANTOR COLBURN LLP
20 Church Street
22nd Floor
Hartford, CT 06103

EXAMINER	
ZERVIGON, RUDY	
ART UNIT	PAPER NUMBER
1716	

NOTIFICATION DATE	DELIVERY MODE
02/08/2011	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

usptopatentmail@cantorcolburn.com

Office Action Summary	Application No.	Applicant(s)	
	10/585,267	TOMINAGA ET AL.	
	Examiner	Art Unit	
	Rudy Zervigon	1716	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 June 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 3-8* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 3-8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Claims 1 and 3-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Fujioka; Hiroshi (US 5180684 A). Fujioka teaches a film forming system (Figure 1; column 2; lines 45-67) comprising a chamber (1; Figure 1; column 2; lines 45-67), a precursory gas (12; Figure 1; column 2; lines 45-67) supplying line (12-15-13-1; Figure 1; column 2; lines 45-67) to supply the chamber (1; Figure 1; column 2; lines 45-67) with precursory gas (12; Figure 1; column 2; lines 45-67), a reactive gas (11; column 2; lines 45-67) supplying line (applicant's 1; Figure 6; 11-14-13-1; Figure 1; column 2; lines 45-67) to supply the chamber (1; Figure 1; column 2; lines 45-67) with reactive gas (11; column 2; lines 45-67), a purge gas supplying line (applicant's 3; Figure 6, all downstream of 9; Figure 1) to supply purge gas that purges the precursory gas (12; Figure 1; column 2; lines 45-67) and the reactive gas (11; column 2; lines 45-67), and that forms a thin film on a substrate in the chamber (1; Figure 1; column 2; lines 45-67) by supplying the precursory gas (12; Figure 1; column 2; lines 45-67) or the reactive gas (11; column 2; lines 45-67) and purging alternately, and a precursor gas middle line (applicant's 22; Figure 6; piping between 15 and 13) having a predetermined volume that is arranged on a part or all of the precursor supplying line (applicant's 2; Figure 6; 12-15-13-1; Figure 1; column 2; lines 45-67) and into which the precursory gas (12; Figure 1; column 2; lines 45-67) can be filled at a time when the precursory gas (12; Figure 1; column 2; lines 45-67) is not supplied, and/or a reactive gas middle line (applicant's 12; Figure 6; piping between 14 and 13; Figure 1) having a certain

volume that is arranged on a part or all of the reactive gas (11; column 2; lines 45-67) supplying line (applicant's 1; Figure 6; 11-14-13-1; Figure 1; column 2; lines 45-67) and into which the reactive gas (11; column 2; lines 45-67) can be filled at a time when the reactive gas (11; column 2; lines 45-67) is not supplied wherein a switching valve (15,13 OR 14,13; Figure 1; column 3;; lines 26-27) is arranged on an inlet port and an outlet port of the precursory gas middle line (applicant's 22; Figure 6; piping between 15 and 13) so as to specify a volume of the precursory gas middle line (applicant's 22; Figure 6; piping between 15 and 13) with the cross-sectional area of a line body constituting the precursory gas middle line (applicant's 22; Figure 6; piping between 15 and 13) and a distance between each of the switching valves (15,13 OR 14,13; Figure 1; column 3;; lines 26-27), as claimed by claim 1. Applicant's claim requirement of "reactive gas", "precursory gas", "purging alternately", "at a time when the precursory gas is not supplied", and "at a time when the reactive gas is not supplied" are claim requirements of intended use in the pending apparatus claims. Further, it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter , 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim (In re Casey,152 USPQ 235 (CCPA 1967); In re Otto , 136 USPQ 458, 459 (CCPA 1963); MPEP2111.02).

Fujioka further teaches

i. The film forming system (Figure 1; column 2; lines 45-67) described in claim 1, wherein the switching valve (15,13 OR 14,13; Figure 1; column 3;; lines 26-27) is a three-way valve, as claimed by claim 3

ii. The film forming system (Figure 1; column 2; lines 45-67) described in claim 1, wherein the purge gas supplying line (applicant's 3; Figure 6, all downstream of 9; Figure 1) is connected to the precursory gas (12; Figure 1; column 2; lines 45-67) supplying line (12-15-13-1; Figure 1; column 2; lines 45-67) to which the precursory gas middle line (applicant's 22; Figure 6; piping between 15 and 13) is arranged and/or the reactive gas (11; column 2; lines 45-67) supplying line (applicant's 1; Figure 6; 11-14-13-1; Figure 1; column 2; lines 45-67) to which the reactive gas middle line (applicant's 22; Figure 6; piping between 15 and 13) is arranged and the precursory gas (12; Figure 1; column 2; lines 45-67) and/or the reactive gas (11; column 2; lines 45-67) each of which is filled in the precursory gas middle line and/or the reactive gas middle line (applicant's 22; Figure 6; piping between 15 and 13) is supplied to the chamber (1; Figure 1; column 2; lines 45-67) by pushing out the precursory gas (12; Figure 1; column 2; lines 45-67) and/or the reactive gas (11; column 2; lines 45-67) by the use of the purge gas, as claimed by claim 4

iii. The film forming system (Figure 1; column 2; lines 45-67) described in claim 1, wherein the precursory gas (12; Figure 1; column 2; lines 45-67) and/or the reactive gas (11; column 2; lines 45-67) is supplied to the chamber (1; Figure 1; column 2; lines 45-67) in 0.1 through 2 second, as claimed by claim 5. Applicant's entire claim requirement is a claim requirement of intended use in the pending apparatus claims. Further, it has been

held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter , 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim (In re Casey,152 USPQ 235 (CCPA 1967); In re Otto , 136 USPQ 458, 459 (CCPA 1963); MPEP2111.02).

iv. The film forming system (Figure 1; column 2; lines 45-67) described in claim 1, and that is arranged to purge the chamber (1; Figure 1; column 2; lines 45-67) so that each concentration of the precursory gas (12; Figure 1; column 2; lines 45-67) and/or the reactive gas (11; column 2; lines 45-67) becomes less than or equal to 1/1000 in less than or equal to 2 seconds, as claimed by claim . Applicant's entire claim is a claim requirement of intended use in the pending apparatus claims. Further, it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter , 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim (In re Casey,152 USPQ 235 (CCPA 1967); In re Otto , 136 USPQ 458, 459 (CCPA 1963); MPEP2111.02).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fujioka; Hiroshi (US 5180684 A) in view of Ahn, Kie Y. (US 20020122885 A1). Fujioka is discussed above. Fujioka does not teach Fujioka's film forming system (Figure 1; column 2; lines 45-67) described in claim 1, wherein concentration adjusting devices (Applicant's 91/92; Figure 9; Fujioka's 16; Figure 1) to adjust each concentration of Fujioka's precursory gas (12; Figure 1; column 2; lines 45-67) and Fujioka's reactive gas (11; column 2; lines 45-67) is connected (at 15) to Fujioka's precursory gas (12; Figure 1; column 2; lines 45-67) supplying line (12-15-13-1; Figure 1; column 2; lines 45-67) and Fujioka's reactive gas (11; column 2; lines 45-67) supplying line (applicant's 1; Figure 6; 11-14-13-1; Figure 1; column 2; lines 45-67)[1] respectively and each concentration adjusting device (Applicant's 91/92; Figure 9; Fujioka's 16; Figure 1) adjusts each concentration of Fujioka's precursory gas (12; Figure 1; column 2; lines 45-67) and Fujioka's reactive gas (11; column 2; lines 45-67) so as to supply each gas at more than or equal to 0.15.times.10.sup.-6 mol/cm.sup.2 with respect to an area of the substrate on which the thin film is formed, as claimed by claim 7. With respect to Applicant's claim requirement of "..so as to supply each gas at more than or equal to 0.15.times.10.sup.-6

[1] At 14

mol/cm.sup.2 …", said claim requirement is an intended use claim requirement in the pending apparatus claims.

Further, it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter , 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim (In re Casey,152 USPQ 235 (CCPA 1967); In re Otto , 136 USPQ 458, 459 (CCPA 1963); MPEP2111.02).

Ahn also teaches a CVD apparatus including a dedicated vacuum pump for his precursor gases (X,Y; Figure 1).

It would have been obvious to one of ordinary skill in the art at the time the invention was made for Fujioka to add dedicated pumps for each of Fujioka's sources as taught by Ahn.

Motivation for Fujioka to add dedicated pumps for each of Fujioka's sources as taught by Ahn is for "concurrent" pumping to establish "initial pressure conditions" as taught by Ahn ([0035]).

5. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fujioka; Hiroshi (US 5180684 A) in view of Udagawa; Takashi (US 6645302 B2). Fujioka is discussed above. Fujioka does not teach Fujioka's film forming system (Figure 1; column 2; lines 45-67) described in claim 1, wherein each of Fujioka's precursory gas (12; Figure 1; column 2; lines 45-67) supplying line (12-15-13-1; Figure 1; column 2; lines 45-67) and Fujioka's reactive gas (11; column 2; lines 45-67) supplying line (applicant's 1; Figure 6; 11-14-13-1; Figure 1; column 2; lines 45-67) is independently connected to Fujioka's chamber (1; Figure 1; column 2; lines 45-

67).

Udagawa teaches a similar CVD vapor precursor delivery system (Figure 17) including independently connected precursor delivery lines (29-1, 29-2; Figure 17) from independent sources (49, 50; Figure 17) respectively.

It would have been obvious to one of ordinary skill in the art at the time the invention was made for Fujioka to add additional precursor source(s) as taught by Udagawa.

Motivation for Fujioka to add additional precursor source(s) as taught by Udagawa is for depositing films of plural compositions as taught by Udagawa (column 9, lines 28-60).

Response to Arguments

6. Applicant's arguments filed November 30, 2010 have been fully considered but they are not persuasive.

Applicant states:

“

However, Applicants respectfully assert that this piping between structures 13 and 15 and 14 and 15 cannot be the specifically claimed precursory gas middle line or the specifically claimed reactive gas middle line, as claimed in claim 1. For example, in Fujioka, pump 16 lies downstream of the line that is connected to MFC 9. Thus, the piping between 13 and 15 and the piping between 13 and 14 is sucked by pump 16, and gas flows from MFC 9, 10, 11, or 12, to pump 16. Therefore, the piping between 13 and 15 and the piping between 13 and 14 cannot be filled with the precursory gas or the reactive gas at a time when the precursory gas or the reactive gas is not supplied. Accordingly, it is respectfully asserted that Fujioka does not disclose the

specifically claimed precursory gas middle line or the specifically claimed reactive gas middle line, as claimed in claim 1

“

In response, the Exaniner disagrees. Fujioka describes valves 13-15 as being three-way valves (column 3;; lines 26-27) which by definition has three different possible directions / logic positions for providing opening and closing states. Although valves 13, 14, and 15 have 5, 4, and 4 pipes interfaceing each valve respectiively, the Examiner believes that each valve must have a closed/open position aligned with the pumping common line. The alternative, as suggested by Applicant’s above argument, is that Fujioka’s three way valves are always open to the common exhaust line. This would render Fujioka’s apparatus inoperable. Thus, Applicant’s statement that “the piping between 13 and 15 and the piping between 13 and 14 is sucked by pump 16, and gas flows from MFC 9, 10, 11, or 12, to pump 16 ” is offered by Fujioka in the alternative. Such a condition is not always present becuase valves 13-15 have open/close states not permitting said condition.

Applicant states:

“

The distinction noted above is important and non-trivial because it results in significant advantages over conventional devices. For example, as explained on page 2 of the Office Action, the structure of claim 1 improves throuRhput durinR a process of forminR the thin film and improves quality of the thin film.

“

In response, Applicant's above-described benefits are believed to be achieveable by Fujioka's Figure 1 structure. When the structure recited in the reference is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent (In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977); MPEP 2112.01).

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Rudy Zervigon whose telephone number is (571) 272-1442. The examiner can normally be reached on a Monday through Thursday schedule from 8am through 6pm EST. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Any Inquiry of a general nature or relating to the status

of this application or proceeding should be directed to the Chemical and Materials Engineering art unit receptionist at (571) 272-1700. If the examiner can not be reached please contact the examiner's supervisor, Parviz Hassanzadeh, at (571) 272- 1435.

/Rudy Zervigon/

Primary Examiner, Art Unit 1792